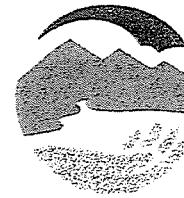


Idaho **W**ellhead **P**rotection **P**lan



**Idaho Division of
Environmental Quality**



**Idaho Wellhead
Protection Work Group**

February 1997

ACKNOWLEDGEMENTS

Many thanks to the members of the Idaho Wellhead Protection Work Group and the interested public. They have provided valuable input, comments, and support throughout the long and sometimes frustrating process of state plan development. This advisory group has been very helpful to the state, not only because they were able to balance policy development with the realities of implementation, but also because they worked with the conviction that this program will be able to make a positive difference to the environment and to the quality of life of all Idahoans.

We would also like to thank and acknowledge the Region 10 and Idaho Office of the U.S. Environmental Protection Agency, who have provided both financial and technical support for the development of this plan. Their assistance has been greatly appreciated.

TABLE OF CONTENTS

Section	Page
ACKNOWLEDGEMENTS	I
TABLE OF CONTENTS	II
LIST OF TABLES	VII
LIST OF FIGURES	VIII
LIST OF ACRONYMS	IX
1.0 INTRODUCTION	1-1
2.0 PROGRAM SUMMARY, PURPOSE AND DEVELOPMENT	2-1
2.1 Program Summary and Purpose	2-1
2.2 Program Development	2-2
2.2.1 Wellhead Protection Work Group	2-3
2.2.2 Technical Task Force	2-3
2.2.3 Other Participants	2-4
2.3 General Program Policies	2-4
2.3.1 Review Process for the State Plan	2-4
2.3.1.1 Rationale/Discussion	2-4
2.3.2 Program Type	2-4
2.3.2.1 Rationale/Discussion	2-5
2.3.3 State Review and Recognition Process for Local Plans	2-5
2.3.3.1 Rationale/Discussion	2-7
2.3.4 Phasing and/or Prioritizing Procedure	2-8
3.0 PROGRAM ROLES AND RESPONSIBILITIES	3-1
3.1 Roles and Responsibilities for Wellhead Protection	3-1
3.1.1 Federal Agency Roles and Responsibilities	3-1
3.1.2 Agency Roles and Responsibilities	3-1
3.1.3 Local Roles and Responsibilities	3-3
3.1.4 Water Purveyor Roles and Responsibilities	3-4
3.2 General Ground Water Roles and Responsibilities	3-4
3.2.1 Government Agencies	3-4
3.2.2 Other Organizations	3-5
3.3 Community Planning Teams	3-5
4.0 WELLHEAD PROTECTION AREA DELINEATION	4-1
4.1 Wellhead Protection Area Goals	4-1
4.1.1 Background	4-1
4.1.2 State Goals	4-1
4.1.2.1 Rationale/Discussion	4-3
4.2 Types of Water Supplies	4-3

TABLE OF CONTENTS

Section	Page
4.2.1 Background	4-3
4.2.2 Water Supplies Relevant to the Idaho Wellhead Protection Program ..	4-4
4.2.2.1 Rationale/Discussion	4-4
4.3 Delineation of Wellhead Protection Areas	4-5
4.3.1 Background	4-5
4.3.1.1 System Size	4-5
4.3.1.2 Drinking Water Violation Data	4-6
4.4 Delineation Methods - Overview	4-7
4.4.1 Arbitrary Fixed Radius	4-9
4.4.2 Calculated Fixed Radius	4-9
4.4.3 Simplified Variable Shapes	4-9
4.4.4 Analytical Methods	4-9
4.4.5 Hydrogeologic Mapping	4-10
4.4.6 Numerical Flow/Transport Models	4-10
4.5 Delineation Approaches in Idaho	4-10
4.5.1 General Description	4-10
4.5.1.2 Rationale/Discussion	4-12
4.6 Basic Approach	4-14
4.6.1 Basic I Method	4-14
4.6.2 Basic II Method	4-22
4.6.3 Rationale/Discussion	4-22
4.7 Refined Approach	4-24
4.7.1 Refined Method Zones	4-25
4.7.2 Refined Exception Method Zones	4-27
4.7.3 Rationale/Discussion	4-28
4.8 Special Cases of Wellhead Protection	4-29
4.8.1 A Special Case Example: Rathdrum Prairie Aquifer	4-29
4.8.2 Rationale/Discussion	4-31
4.9 Wellhead Protection Area Delineation and Pumping Rate Change	4-31
4.9.1 Rationale/Discussion	4-31
4.10 Wellhead Protection Areas for Wellfields	4-31
4.10.1 Rationale/Discussion	4-31
4.11 Wellhead Protection Area Boundary Adoption	4-31
4.11.1 Rationale/Discussion	4-32
4.12 Wellhead Protection Information to be Submitted to the State	4-32
4.12.1 Rationale/Discussion	4-32

TABLE OF CONTENTS

Section	Page
5.0 INVENTORY OF POTENTIAL SOURCES OF CONTAMINATION	5-1
5.1 Potential Sources of Contamination	5-1
5.2 Inventory Responsibilities and Procedures	5-1
5.2.1 Responsibilities of the Water Purveyor and Local Government	5-1
5.2.1.1 Rationale/Discussion	5-7
5.2.2 Responsibilities of the Lead Agency	5-7
5.2.2.1 Rationale/Discussion	5-7
5.2.3 Frequency of Inventory	5-8
5.2.3.1 Rationale/Discussion	5-8
6.0 MANAGEMENT OF POTENTIAL SOURCES OF CONTAMINATION	6-1
6.1 Wellhead Protection Area Management Policies	6-1
6.1.1 Duties	6-1
6.1.2 Management of the Wellhead Protection Area	6-1
6.1.2.1 Rationale/Discussion	6-1
6.2 Management Tools for Wellhead Protection Areas	6-3
6.3 Wellhead Protection Area Management: An Example	6-6
6.4 Multi-Jurisdiction Wellhead Protection Areas	6-7
6.5 Wellhead Protection Projects	6-8
6.5.1 Rural Communities	6-8
6.5.2 Urban Communities	6-8
6.5.3 Communities Involved with Aquifer Protection	6-9
7.0 CONTINGENCY PLANS	7-1
7.1 Local Contingency Plans	7-1
7.1.1 Lead Entity	7-1
7.1.1.1 Rationale/Discussion	7-1
7.1.2 Incorporation of Contingency Plans into Other Local Plans	7-1
7.1.2.1 Rationale/Discussion	7-1
7.1.3 Local Contingency Plan Implementation	7-2
7.1.3.1 Rationale/Discussion	7-2
7.2 Recommended Topics in a Local Contingency Plan	7-2
7.3 State Emergency Plan	7-4
7.3.1 Relevant State Emergency Plans	7-4
7.4 A Drinking Water Contamination Case Study	7-8
8.0 WELLHEAD PROTECTION FOR NEW WELLS	8-1
8.1 Agency Responsibilities	8-1
8.2 Major Wellhead Protection Issues for New Wells	8-2

TABLE OF CONTENTS

Section	Page
8.2.1 Plan, Site and Protect Future Drilling Sites	8-2
8.2.1.1 Rationale/Discussion	8-3
8.3 Well Construction	8-3
8.3.1 Rationale/Discussion	8-4
8.4 Incorporation of New Wells into Local Plans	8-4
8.4.1 Rationale/Discussion	8-4
9.0 PUBLIC PARTICIPATION AND EDUCATION	9-1
9.1 Public Participation	9-1
9.1.1 Public Participation Procedure	9-1
9.1.2 Specifics of Public Participation Procedure	9-2
9.2 Public Education	9-4
9.2.1 Material Development	9-4
10.0 PROGRAM IMPLEMENTATION	10-1
10.1 General Implementation Approach	10-1
10.2 Implementation Strategy Elements	10-3
10.2.1 Coordination with Other Related Programs	10-3
10.2.1.1 Groundwater Quality Plan	10-3
10.2.1.2 Wastewater Land Application Program	10-5
10.2.1.3 Pollution Prevention Program	10-5
10.2.1.4 Sole Source Aquifer Program	10-5
10.3 Education and Outreach	10-6
10.4 Incentives and Projects to Assist Program Implementation	10-6
10.5 Technical Assistance	10-7
10.6 Funding Assistance	10-9
10.6.1 Federal Funds	10-9
10.6.2 State Funds	10-10
10.7 Wellhead Protection Program Components	10-10
10.7.1 Roles and Duties	10-10
10.7.2 Wellhead Protection Area Delineation	10-10
10.7.3 Inventory of Potential Sources of Contamination	10-12
10.7.4 Management of Potential Sources of Contamination	10-13
10.7.4.1 Compendium of Ordinances	10-13
10.7.4.2 Guidance Development	10-13
10.7.4.3 Coordination with Other State Agencies	10-13
10.7.5 Contingency Plans	10-13
10.7.6 Wellhead Protection for New Wells	10-14

TABLE OF CONTENTS

Section		Page
10.7.7 Public Education and Participation	10-14	
10.7.7.1 Drinking Water Program	10-14	
10.7.7.2 Pollution Prevention Program	10-15	
10.7.7.3 Home-A-Syst Program	10-15	
10.7.7.4 Education Grant	10-16	
10.7.7.5 Additional Education Assistance	10-17	
11.0 CONCLUSIONS	11-1	
12.0 BIBLIOGRAPHY	12-1	
13.0 GLOSSARY	13-1	
APPENDIX A		
1986 Amendments to the Safe Drinking Water Act: Section 1428	A-1	
APPENDIX B		
Idaho Groundwater Quality Protection Act	B-1	
APPENDIX C		
Members of the Wellhead Protection Work Group, Technical Task Force and Other Participants	C-1	
APPENDIX D		
Lead Agency Designation	D-1	
APPENDIX E		
An Evaluation of Sources of Groundwater Contamination	E-1	
APPENDIX F		
Basic Wellhead Protection Area Delineation for the State of Idaho	F-1	

LIST OF TABLES

Table 4.1	Drinking Water Supply Types in Idaho	4-4
Table 4.2	Regulated Water Systems in Idaho	4-6
Table 4.3	Sizes of Regulated Community and Non-Community, Non-Transient Systems in Idaho	4-6
Table 4.4	Bacteriological Compliance Report - Contaminant Violations in 1992 ..	4-7
Table 4.5	Bacteriological Compliance Report - Monitoring and Reporting	4-7
Table 4.6	Wellhead Protection Zones Using the Basic I Method	4-16
Table 4.7	Sources of Information to Determine the Producing Aquifer	4-18
Table 4.8	Fixed Radii for the Major Aquifers in Idaho	4-19
Table 4.9	Wellhead Protection Zones Using the Basic II Method	4-23
Table 4.10	Wellhead Protection Zones Using the Refined Method	4-26
Table 4.11	Wellhead Protection Zones Using the Refined Exception Method	4-28
Table 4.12	Zones for the Rathdrum Prairie Aquifer	4-30
Table 5.1	Categories of Potential Sources of Contamination	5-2
Table 6.1	Management Policies for the Zones of a Wellhead Protection Area	6-2
Table 6.2	Management Tools for Wellhead Protection Areas	6-4
Table 6.3	Examples of Zone Management Concepts	6-7
Table 7.1	Local Contingency Plan Topics	7-3
Table 7.2	State Agencies with Relevant State Emergency Plan Roles	7-6
Table 7.3	Federal/Other Entities with Relevant State Emergency Plan Roles	7-7
Table 8.1	State Agency Responsibilities	8-1
Table 10.1	Summary of the Implementation Strategy	10-2
Table 10.2	Estimated Populations of Cities in Idaho (1990 Census)	10-8

LIST OF FIGURES

Figure 2.1	Federal and State Authority for the Wellhead Protection Program	2-1
Figure 2.2	Citizen Advisory Groups that Developed the Idaho Wellhead Protection Plan	2-3
Figure 2.3	Review and Certification Process of Wellhead Protection Plans	2-6
Figure 2.4	Elements of a Certified Wellhead Protection Program	2-7
Figure 4.1	Wellhead Protection Goals for Idaho	4-2
Figure 4.2	Overview of Delineation Methods	4-8
Figure 4.3	Philosophy of the Idaho Wellhead Protection Program	4-11
Figure 4.4	Delineation Approaches for the State Program	4-12
Figure 4.5	Assessment Guide to Select Appropriate Delineation Method	4-13
Figure 4.6	Wellhead Protection Zones of the Basic I Method	4-15
Figure 4.7	Delineation Procedure for the Basic I Method	4-16
Figure 4.8	Map of Major Aquifers in Idaho	4-21
Figure 4.9	Delineation Procedure for the Basic II Method	4-22
Figure 4.10	Assessment for Appropriate Use of the Refined Exception Method	4-27
Figure 4.11	Assessment for Appropriate Use of the Special Case Approach	4-29
Figure 4.12	Wellfield Concept Using the Basic I Method	4-33
Figure 6.1	Conceptualized Groundwater Flow to a Pumping Well	6-3
Figure 7.1	State Emergency Plans Relevant to the Idaho Wellhead Protection Program	7-5
Figure 8.1	Wellhead Protection Topics for New Wells	8-2
Figure 10.1	Programs and Activities to be Coordinated with the Wellhead Protection Program	10-4

LIST OF ACRONYMS

The acronyms that are used under the Program and Authority topics are listed below:

BMP	Best Management Plan
DWIMS	Drinking Water Information Management System
EDMS	Environmental Data Management System
EPA	United States Environmental Protection Agency
IDA	Idaho Department of Agriculture
IDEQ	Idaho Division of Environmental Quality
IDWR	Idaho Department of Water Resources
MCL	Maximum Contaminant Level
ppb	Parts per billion